of a certain constant force indicated by the galvanometer, a little chemical action, brought into play where the iron and platinum were in contact as before (819), produced a current far stronger than that previously existing. If then, from the weaker current, the part of the effect due to chemical action be abstracted, how little room is there to suppose that any effect is due to the contact of the metals!

838. But a *red nitric acid* with platinum plates conducts a thermo current well, and will do so even when considerably diluted (806). When such red acid is used between iron and platinum, the conducting power is such, that one half of the permanent current can be overcome by a counter thermo current of bismuth and antimony. Thus a sort of comparison is established between a thermo current on the one hand, and a current due to the joint effects of chemical action on iron and contact of iron and platinum on the other. Now considering the admitted weakness of a thermo current, it may be judged what the strength of that part of the second current due to contact can at the utmost be; and how little it is able to account for the strong currents produced by ordinary voltaic combinations.

839. If for a clean iron wire one oxidised in the flame of a spirit-lamp be used, being associated with platinum in pure strong nitric acid, there is a feeble current, the oxide of iron being positive to the platinum, and the facts mainly as with

iron. But the further advantage is obtained of comparing the contact of strong and weak acid with this oxidised wire. If one volume of the strong acid and four volumes of water be mixed, this solution may be used, and there is even less deflec- tion than with the strong acid: the iron side is now not sensibly active, except the most delicate means be used to observe the current. Yet in both cases if a chemical action be intro- duced in place of the contact, the resulting current passes well, and even a thermo current can be made to show itself as more powerful than any due to contact.

840. In these cases it is safest to put the whole of the oxidised iron under the surface and connect it in the circle by touching it with a platinum wire; for if the oxidised iron be continued through from the acid to the air, it is almost certain to suffer from the joint action of the acid and air at their surface of contact.

841. I proceeded to use a fluid differing from any of the